Name: Date:

Polynomial Factoring solution (version 623)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 2x + 25 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(25)}}{2(1)}$$

$$x = \frac{-(2) \pm \sqrt{4 - 100}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{-96}}{2}$$

$$x = \frac{-2 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{-2 \pm 4\sqrt{6}\, i}{2}$$

$$x = -1 \pm 2\sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-6 - 9i$ and $-7 + 4i$ in standard form $(a + bi)$.**

Solution

$$(-6 - 9i) \cdot (-7 + 4i)$$

$$42 - 24i + 63i - 36i^2$$

$$42 - 24i + 63i + 36$$

$$42 + 36 - 24i + 63i$$

$$78 + 39i$$

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3. **Write function $f(x) = x^3 - 10x^2 + 29x - 20$ in factored form. I'll give you a hint: one factor is $(x - 1)$.**

Solution

	1	-10	29	-20
1		1	-9	20
	1	-9	20	0

$$f(x) = (x-1)(x^2 - 9x + 20)$$

$$f(x) = (x-1)(x-4)(x-5)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+2)^2 \cdot (x-2) \cdot (x-5)$$

Sketch a graph of polynomial $y = p(x)$.